Making Knowledge Management Research more Scientific, Relevant, and Engaged: A Comparative Study of Academic ECKM Papers

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Abstract: The purpose is to analyse and compare all the academic papers in the proceedings of the European Conference on Knowledge Management (ECKM) in 2017 (Barcelona), 2018 (Padua), 2019 (Lisbon), and the digital conference in 2020 (Coventry). The methodology is to code and classify 440 papers and use five contemporary science frameworks to describe and analyse the papers. The theoretical implication of contemporary KM is a research field without common paradigms, domains, and perspectives without accumulating knowledge. The KM researchers do not understand the nature of knowledge management as a field where the research cannot be replicated, synthesized, or theorized. Knowledge management needs to move along from the empirical research paradigm to a clarified subjectivity and action-basedresearch. The criticism implying acceptable/unacceptable solutions and constructed adequate/inadequate solutions for corporations and societies have strengthened their place, offering new paradigms and perspectives. The way to do this is to let in controversial, greener, and sustainable studies, whatever objectivity or subjectivity the studies have. We need more actual problem focused and less knowledge and instrument focused studies. KM will have a higher responsibility for sustainability and greener corporations and the possibility of accumulating knowledge into replication and synthesizing for general knowledge. The rate of tested and replicated studies is for the four conferences zero. The tested part, but not replicated, is 80%. The rate of untheorized untheorizable concepts is zero, the rate of theorized but not synthesized studies is zero, while the number of synthesized, theorized, and conceptual studies is around 20%. To become a discipline or research domain KM needs to replicate both empirical and conceptual studies. The only way to accumulate knowledge is through replication giving paradigms for verification and falsification. To move ahead for better quality in the research, we must break free from the empirical and materialistic paradigms and move into the clarified subjectivity and action paradigm. Paradigmatic ecumenism will tend to a fiercer but idea-generating debate. This pluralistic approach will give more engaged practical research representing more sustainable societies and businesses. ECKM is on the road to include more pluralistic perspectives upon sustainability, value creation, gender issues, and the design of future knowledge work. There is a critical openness toward these issues making ECKM 2020 a more relevant conference than the ECKM conferences in 2017, 2018, and 2019. The 2020 conference more open up for reflections, dialogues, and criticism upon existing problems and knowledge asking about what is the adequate actual KM solutions.

Keywords: Knowledge paradigms, Knowledge concepts, Knowledge management, Knowledge creation, Knowledge accumulation, Knowledge sharing

1. Introduction

Two essential points of departure for this paper's discussion are the discussion of significant trends in contemporary philosophy of science and the relevance for knowledge management research. Second, the conceptual broadening of knowledge management research. The line between relevance and rigor in knowledge management research is discussed versus different degrees of complexity. The discussion about if it is at all possible to establish objective criteria is central in the paper**.** The nature of the knowledge management concept is also considered. Verification and falsification require replication of studies, but the knowledge management concept might be a concept without the possibility for replication, theorizing, and synthesizing. The concept will be subjective of nature, and the only possible interpretations will be a form of clarified subjectivity.

There are many reflections and even speculations about the quality and relevance of knowledge management research. Nonaka (1985) created the importance of knowledge management in his book “The knowledge creating company," describing knowledge as the essential resource in any corporation. Nonaka (1985) reflects upon knowledge management but does not make any empirical tests of the proposed theories. However, many similar fields like information management, information resources management, information systems management, information technology management, and intellectual capital management are still around in their societies and journals. We have different areas of knowledge and different types of knowledge which we are sharing, managing, and organizing. We have different levels of personal knowledge. As knowledge workers,

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we specialists in a small area, while we have a working familiarity in a larger area and a nodding familiarity in a broader knowledge area. A part of our knowledge is explicit, and a more significant part tacit. We are further all the time learning and de-learning our knowing according to personal needs, societal needs, and corporate needs. ECKM arranges an annual conference for research papers covering all these aspects. The research papers are published in the annual conference proceedings. Analyzing all these papers will then give us an overview of all the aspects covered by knowledge management and state-of-the-art research quality of the field knowledge management. The research papers give a unique empirical possibility to evaluate the actual scientific situation to compare several conferences. The methodology for the study has been to evaluate all the research papers for 2017, 2018, 2019, and 2020 and compare the results. The classification of papers is based upon the abstract, introduction, methodology, literature review, findings, analyses, and conclusion. Classification is compared and coded to the five contemporary frameworks of the philosophy of science to answer the research questions.

Our research questions for the study are as follows:

1. What is the KM philosophy of science framework characteristics of academic research papers in contemporary KM presented at the ECKM conferences?
2. What is the philosophy of science requirements to make KM research more creative, engaged, and relevant?
3. How can we make KM research more creative, engaged, and relevant?
4. How can we make KM research contribute to more sustainable and greener businesses?
5. What are the future characteristics of KM research?
6. What is the rate of tested and replicated, tested but not replicated, and untested KM research?
7. What is the rate of untheorized untheorizable concepts, theorized, but not synthesized and theorized and synthesized KM?

The main conclusion is that KM does not replicate investigations and focuses on the instruments and the existing knowledge and not upon actual problems. The knowledge used is what we already know and not what we do not know that we know. Criticism and especially constructions are less used. What is adequate and not adequate and what is acceptable and not acceptable are seldom asked. The methodology is concentrated upon qualitative and quantitative survey research interpreted as objective results. The results are presented as definitive and more seldom as sensitizing presenting directions along which to look. The deduction is chosen much more than induction to look scientific. The paradigms are empirical and materialistic and more seldom subjective and action-based. There are no agreed-upon paradigms or research domains or perspectives, or schools. KM research is not repeated, theorized, or synthesized, and there is no knowledge accumulation. We define the state-of-art as a pre-scientific situation.

Where any result may be as enjoyable as another result, KM has to accept that results may not be replicable, testable, or synthesized-able. KM must develop inductive clarified subjectivity and action-based studies constructing and testing the consequences of sustainable and greener businesses and societies. Trust-based, value-based, and transparency-based leadership should be an essential part of the KM concept. KM will then foster creativity, engagement, and relevance.

The paper is organized as follows:

The study is, in many respects, what we look upon as a clean-cut study. The introduction introduces what we are looking into, how we look into what we are looking into, and the main results. The study continues with the literature review and the methodology. The literature review might have been a theory of everything within KM but is kept to the philosophy of science frameworks. We continue with the five philosophy of science frameworks and a presenting and discussion of findings. We answer the six research questions in our section and continue with the conclusions, the framework for future research, and limitations. A research paper like this is about cutting corners to get everything together. We believe that we have positively cut corners, creating the foundation for learning and reflection upon the future state of KM.

2. A literature review of contemporary philosophy of science compared to KM foundations

"There are trivial truths and great truths. The opposite of a trivial truth is false; the opposite of a great truth is also true" (Bohr 1948:120). Bohr's position is that subjective speculations are needed to advance any science,

even physics. Bohr argued that any discipline needs a basis from science and physics philosophy and should keep this in mind to get alternative proposals and solutions. Feyerabend's position (1979) was that we must break the methodological rules and procedures to advance science and the social sciences. Our argumentation has anyhow to be logical and convincing. Popper (1968) noted that we are standing on quicksand where pure falsification and verification will not advance any science in itself. Data do not prove anything at all. It is our logical interpretation of the data that might make a verification or falsification. If a falsification or verification is possible (Lakatos 1978) or if every result is relative dependent upon the cultural context (Toulmin 2003).

Kant (1787) found that universities had two tasks. The primary mission was to educate professions, and the second job was to develop the sciences as sciences. Kant included the humanities (mainly philosophy and theology) among the sciences. The two tasks demanded different knowledge, experiences, and attitudes. Wilson (1979, 1984) identified this as two kinds of powers and cognitive authorities. The procedures and rules have to be different for these powers. However, both forces had to work with relevant problems for their context to survive and not degenerate as useless powers. Both Wilson (1984) and Toulmin (2003) noted that all knowledge is contextual and relative. All knowledge is subjective and might be interpreted differently according to the context of the knowledge. Berger and Luckmann (1968) concluded that all activities, including the sciences, are social constructions, and the question is how to make adequate constructions acceptable. The construction of reality is subjective, and the glasses we are using to define reality will form what reality we are seeing.

Knowledge management research is a new discipline that we might date back to Nonaka (1985) and a discipline without agreed-upon paradigms, perspectives, or schools. Kuhn (1970) identifies disciplines like knowledge management research as a pre-scientific situation where any discipline might remain until the discipline dies or advances a new paradigm. Lakatos (1970) argues that a movement from small science to big science in the number of involved researchers and grants does not improve a discipline's knowledge. There might be a degeneration both in more minor and more extensive research programs, according to Lakatos. Creativity, imagination, and relevance do not have to do with the size of the programs or schools. The most available research to industrialize is quantitative survey research, where easily collectible data are often collected and presented as the emperor's new clothes through fanciful instruments. Kuhn (1970) and Lakatos (1978) defined this as a pre-scientific situation without scientific progress. Feyerabend establishes the nature of leadership and management research as better or worse stories replacing each other not as truths but as socially constructed stories. Feyerabend (1979) described social science survey research as often quantitative and qualitative fact-based case storytelling in constant need of new cases and stories. Feyerabend is proposing the state-of-the-art in KM. Feyerabend notes that storytelling is not replicable, and the usefulness is not a theory or a synthesis but a piece of situation-based information depending upon the actual audience.

Feyerabend (1974) concluded that this was the management literature situation where one case description follows the other case report without knowledge accumulation. According to Feyerabend, this is a storytelling tradition where the marketplace gives new stories all the time. The faster the marketplace develops, the more the researchers will be in dissonance with the market. According to Feyerabend (1987), they will produce more and more "hard science" stories without basis in reality, but with basics in business schools further and further from the firm itself. The businesses themselves will find the highest-rated research less and less relevant (Van-de-Ven 2012, Olaisen and Revang 2017 and 2018). The ruling group in business schools is its exclusive audience and often behaves like a mob against revolutionary thoughts. The group might be dogmatic, authoritarian, and narrow-minded. They represent groupthink. The mind is, in other words, temporarily closed. The highest aim is to control the field and the rules for the accepted puzzle-solving activity. The rules of the puzzle-solving activity become the most crucial issue. There is a Matthew effect in work – those who do it the most accepted way shall get more, and those who do not do it the accepted way shall not be published or getting tenure (Merton 1968). Most researchers in knowledge research are trained in Ph. D. programs with an emphasis on empirical studies. They know that to get papers accepted, they have to follow the "correct" researchers, have a representative sample, and use a proper statistical package to prove their results and end up with decent results or a proposal for another knowledge framework. Marketing and management research is repetitive studies adding no progress or creativity, or hope (Lawrence 1992).

Feyerabend (1974,1987) represents this anarchistic, irrational, and artistic view of science and social science. Feyerabend's reasoning can be summarized as follows. Epistemologists claim that scientists and social scientists follow specific "rational" rules in carrying out their research and that as a result of this, there is "progress."

However, scientists follow "irrational" rules in any science, and there is progress. Therefore it is not needed rules and a research strategy supporting this (Minzberg 1979).

Consequently, we will have to define this discipline as a subjective multidiscipline, and we will have to explore, innovate, simulate an experiment to a much higher degree. We need more subjectivity conflicts and minor harmony and objectivity in our research. Leadership and organizational methodology movement towards phenomenon research take research out of the iron jacket into a flexible and soft jacket opening up for alternative realities (Doh 2015, Schwartz and Stensaker 2014, von Krogh et al. 2012). The movement is towards action-based and clarified subjective paradigms representing instrument-itis, problem-it is, and knowledge-itis criticism and construction to grasp sustainability, gender equality, and new professional working forms.

The business reality is today complex and global. We need to understand both wholisms and atomisms in a good research strategy (Minzberg 1979) and actionable puzzle solving (Morgan 1980). We require imagination and intuition for this process (Bunge 1967, Alvesson and Skjoldberg 2009).

Furustien (1999) describes management research as a form of gurus where gurus from consulting companies and academia define what works, which gives management research studies building more on believing-based than evidence-based knowledge. Furustien describes KM as a discipline-based upon the capital owner's interest and not upon the human resources and the society's need for KM. Locke and Spender (2011) confront that the business elite does not need critical knowledge management research, but only acceptable as-is results defending a conservative business practice. Alvesson and Skjoldberg (2009) ask for bullshit knowledge management research to tell us that we need to differentiate between bullshit and meaning for the employees and organization. Many researchers are redefying KM as studies that uncritical accept the realties as-is and serve the large global owners, while a small part of the academic establishment regard KM as bullshit research (i.e., a form of social science without criticism and innovative inductive constructions). Olaisen and Revang (2018) concluded that more than 30 years of research upon the role of tacit knowledge in KM had given no progress without any possibility to replicate results or synthesize accumulated results. The process of transferring tacit to explicit knowledge remains as unknown in 2021 as in 1959 when Polyani launched the concept. The concept of tacit knowledge might not be testable or possible to replicate or synthesize. As knowledge processes are unknown, knowledge will be difficult to define and even more challenging to manage.

Tornebohm (1983) conceives social science as a sequence of partly cumulative and partly non-cumulative transformations of knowledge (K), problems (P), and instruments(I). Tornebohm (1983) argued that if the sciences and social sciences are going to progress, there must be a balance between K, P, and I. An overemphasis on any of them will hinder a free scientific discourse and, by that, the development of any scientific field. For instance, a central notion from the compound (K1, P1, I 1) to (K2, P1, I2) occurs when the problems P1 are solved to increase the stock of knowledge from K1 to K2. In the problem-solving process, new instruments may be developed or borrowed from other disciplines, at this moment changing I1 to I2. If one of the three aspects is allowed to dominate the other two, the discipline becomes less relevant. Overemphasis on knowledge ("knowledge-itis") may result in empirically empty structures irrelevant to the problems. Empty content structures are the case for business school research in general (VendeVen 2007, Olaisen and Revang 2017), where business schools are producing more and "better" research than ever. However, the practical business world finds the study results less relevant than ever. Preoccupation with problems ("problem-itis") may mean shallow pragmatism and conceptual malnutrition. Finally, too much attention to instruments ("instrument-itis") may erode the substantive core. The focus of the studies is how to practice the research methodology in itself. The researchers end up testing themselves if they can master the instruments and not the theories. Tornebohm (1983) identifies these imbalances in the researcher's orientation as lacking commonly agreed-upon perspectives and defines management research as something less than social science and more than fiction. Kuhn identifies management research as a pre-scientific situation where any discipline might remain until the discipline dies or advances a new paradigm.

The initial KPI maps the aspect of interest (in this case, feature of knowledge structures or processes). The KPI compound in this process filters through what is called the "researchers orientation and worldview" or perspectives in Tornebohm's words (1983) or paradigms in Kuhn's words (1970) or research domains in Olaisen's words (1985). These authors are all referring to the fact that there are alternative ways of approaching the social sciences and, by that, also knowledge management research. The aspects studied are not given once and for all. New knowledge widens the boundaries, as might happen after the broadening of knowledge management

research. Thornebohm's idea is that pluralism is needed in any discipline to get an accumulation of knowledge. If this pluralism lacks time, any discipline will erode and be a mechanistic puzzle-solving of more and more irrelevant problems. The relevance will be found in other disciplines replacing a discipline over time. Kuhn (1970) labeled this as normal science activities where the scientists agree upon good science reproducing noticeable results in quasi-scientific ways to gain respect within a smaller and smaller circle.

Galtung's (1972) idea was to identify four ways of approaching the social sciences in a triangle of theory, data, and values:

1. Empiricism – is what we are presenting true or false (if true consonance if false dissonance)
2. Criticism – is what we are presenting acceptable or not acceptable (if acceptable consonance if not acceptable dissonance)
3. Constructivism – is what we are presenting adequate or inadequate (if adequate consonance if not adequate dissonance)
4. Pluralism – a triangulation of empiricism, criticism, and constructivism (if congruence consonance if not congruence dissonance)

Galtung (1972) assumes that a common goal of all social sciences is to establish what are called sentences dichotomizing their "world space" by including some defining the empirical world by including some "world points" and excluding others. Hence, data sentences explain the empirical world by including what they observe and eliminate what they do not see or imagine. Theory sentences (hypotheses or propositions), on the other hand, define the foreseen world, including aspects that are predicted by the underlying theory. Finally, value sentences refer to the preferred world, including what is accepted and excluding what is rejected. Galtung's idea was that all the social sciences could be analyzed according to this framework. Our research paper is the first time Galtung's and Tornebohm's approaches evaluate academic papers.

Blumer (1969) argued that research concepts in any social sciences might be divided into definitive concepts and sensitizing concepts. The concepts have an essential role in any scientific inquiry. They are usually the anchor point in the interpretation of findings.

The purpose of the definitive concept is to:
Describe-Explain-Predict and Control and Rule (A definitive and objective process). Bunge (1967) named this process "the process of all serious systematic research." Popper (1968) looked upon the definitive concept as the instrumental requirement for verification and falsification.

The sensitizing concepts have another purpose:
Describe-Explore-Reflect-Participate and Change (A subjective and relative process). Glaser and Strauss (1967) named this process “Grounded-theory-research," and Olaisen (1985) named it “dig-where-you-are” research.

Olaisen (1985) divided any kind of knowledge into four types of knowledge:

1. What we know defining
2. What we do not know implying
3. What we do not know that we know as a part of
4. What we do not know that we do not know

According to Olaisen, to get a scientific, intuitive, and creative movement between these four types of knowledge represents the essence of representable and non-representable knowing modes in any science and social science.

Olaisen (1985) divided the social sciences into four paradigms in a quadrate of harmony versus conflict and objectivity versus subjectivity:

1. The empirical paradigm
2. The materialistic political paradigm
3. The clarified subjective paradigm
4. The action paradigm

According to Olaisen, any social science paper could be placed within these four paradigms.
These are the five scientific philosophy frameworks used as analytical tools for analyzing academic papers.

We have in the literature section presented contemporary views of the philosophy of science that will be used as a theoretical framework for our empirical investigations. We have not presented a review of KM as a discipline, but the increasing criticism of the discipline KM regarding the discipline not as an objective discipline, but much as a storytelling discipline dressed up as an objective, testable quantitative discipline. The concept of knowledge is contextual and relative, and studies of knowledge cannot be tested and replicated, or synthesized into general theories. Knowledge is managed and organized, but as knowledge is situational, the management and organizing remain a clarification of different subjective practices. The practices might be described and analyzed, but there will not be any general theory or model since replication is not possible.

3. Methodology and rationale for the study

This paper aims to analyze and compare all the papers in the proceedings of ECKM in 2017, 2018, 2019, and 2020. A total of 440 double-blind reviewed academic papers within a framework of 5000 words for each paper. The approach uses five philosophy of science frameworks and compares the frameworks to the content of the research papers.

Common sense is simply one's primary supply of notions of what the world is like – what kind of things there are, how one can learn about them. As the anthropologist Geertz (1983) says, common sense is a theory of the world – a thin theory but a theory: It can be questioned, disputed, affirmed, developed, formalized, contemplated, and even taught … It is, in short, a cultural system, a discipline … and it rests on the same basis that any other system rests: the conviction by those whose possessions it is of its value, validity, and reliability" (Geertz 1983:76). Common sense is our theory of how the world is organized and of what gives characteristics meaning. Common sense represents our conceptual approach and rationale for choosing our research rationale. The authors of this paper have combined more than 60 years of experience as professors in KM. Our experience gives us a cognitive and affective authority for evaluating KM papers. We represent what Geertz calls "a professional common sense within a disciplined building upon knowledge, experiences, and attitudes" (Geertz 1983:103). We use our professional common sense in coding, evaluating, and classifying each research paper for the five philosophy of science frameworks.

We have used five philosophy of science frameworks to analyze all the papers:

1. Tornebohm's knowledge, problem, and instrument description (1983)
2. Galtung's scientific perspective triangle (1972)
3. Olaisen's four kinds of knowledge identification (1985)
4. Blumer's two kinds of scientific concepts (1969)
5. Olaisen's four kinds of paradigms identification (1985)

This paper has combined (4) and (5) a pluralistic proposal for future progress for knowledge management research.

Each paper has been classified according to:

1. Problem
2. Methodology
3. Theoretical foundation
4. Propositions or hypotheses
5. Presentations of results and analyze
6. Discussion of results
7. Conclusions
8. Theoretical and practical implications
9. Suggestions for further research expanding the KPIs

For each academic paper, a decision has been made for each of the five frameworks according to which format the paper fits within. The decision is based upon the reading of the paper. For two-thirds of the papers, the decision of placing them into a category was clear. For one-third of the papers, we had to make a subjective decision for which category we placed them within. The decision is based upon our notes from each paper, and if in doubt, we have reread the paper. All 430 research papers are finally coded, classified, and categorized for each of the five philosophies of science frameworks. The validity of findings is high in this process. At the same time, the reliability is lower owing to the lack of exactness in definitions and concepts and a high degree of

similarity between the papers. The frameworks from the philosophy of science are used as analytical tools which give a better validity and reliability for the discussion of findings.

Schultz's (1970) understanding of "the theory of common sense" together with his criticism of scientific theorizing is the methodological rationality for how we will describe explorative interpretations and theories in our paper. Our knowledge in everyday life is not without concepts, inductions, and predictions, but they have all the approximate and typical characteristics for the situation. The ideal of everyday life is not a certainty or probability in a mathematical sense, but just likelihood for our interpretations. Anticipation for future states of affairs are conjectures about what can be reasonably expected. When afterward the anticipated state-of-art takes some form in actuality and interpretations, we do not say that our predictions have come true or proved false or that our hypotheses have passed the rest and are replicable, but that our questions and anticipations were well funded or not at all well-funded. The consistency of this system is not that of natural laws but that of typical sequences, relations, and understandings. As a process, we believe, theories render pretty well the reality of social interaction in everyday life. Their function will not be a prediction but usefulness through a better understanding of knowledge management. This anticipation will, in our opinion, be as far as we can reach concerning theories of knowledge management. We agree with Glaser and Strauss (1967) that our job is not to provide a perfect description and analysis of an area or discipline but to develop a description, analysis, and framework that accounts for as much as possible of how societies and corporations can be facilitated by creative, relevant and engaged knowledge management or destructed by a trivial and irrelevant knowledge management research.

Our research rationale can be helped by appropriate and theoretical apparatus that, like lenses or spectacles, extend the range of perception and improve its acuity and actuality; it can also be hindered by distorting lenses. We have the rationale that the ECKM research papers and the philosophy of science frameworks are the best apparatus ever given to study the empirical state-of-art for knowledge management. We have avoided distorting lenses by the inclusion and coding of all 440 papers placed into a few frameworks(5). The interpretations by that into the few variables of each framework giving a simplicity needed to hinder distorting and increasing the range of perception. We hope our methodological reflections and apparatus represent a new kind of thinking in knowledge management as a kind of clarified subjectivity raising questions suitable for reflections, new perspectives, and new understandings.

4. The context of the papers

More than 80% of the papers are surveys and case studies with a description of the case, including questionnaires and interviews with similar references. Two-thirds (65%) of the cases are from private businesses and one-third from public organizations (32%), with a small portion (3%) from non-profit organizations. The primary way of collecting data is through emailed surveys (35%), a combination of interviews and questionnaires (40%), or in-depth interviews (16%), while the remaining part (9%) are conceptual, theoretical studies. More than 80% of the surveys are using statistical packages and advanced statistics. The studies are using quantitative results to prove or disprove hypotheses. The average response rate in the surveys is 32% in 2017, 29% in 2018, 31% in 2019, and 37% in 2019. The low response rate is only discussed in 25% of the studies, while the remaining do not present this as a statistical problem. Only 16% in combine qualitative and quantitative data studies. More than 50% of the studies have propositions or hypotheses derived from the theoretical foundation. The overall picture is standardized statistical survey studies based upon email questionnaires with a relatively low response rate. More than two-thirds of the papers have the exact paper disposal and the same main headings. There is a clear standardization of the disposition of papers and in the presentation of quantitative results. Almost none of the studies are longitude studies. The studies are typical here-and-now studies made for the conference proceedings and later journal publication. Accurate delivery is an industrialized paper processing. About 11% of the studies are innovation studies, 67% are knowledge management studies, and 22% are general global leadership and management studies.

63% of the papers are coming from business schools, while the remaining part is coming from universities (15%), private businesses (15%), and public organizations (7%). 91% of the papers are co-authored, 75% co-authors from the same institution, while 25% have co-authors from different institutions. 78% of the authors are men, while 22% are women. The number of co-authorship and women are increasing from 2016 to 2020. The identity is a European conference dominated by European researchers. 83% of the authors come from Europe, while 10% are Asian authors, 5% are North American (the USA and Canada), and 2% are Oceania authors. The number

of Asian authors is increasing. The dominating European countries are the UK, Germany, Holland, and Scandinavia (Norway, Sweden, and Denmark). The number of papers from France, Spain, Russia, and Eastern Europe is increasing. The most usual author is a male in his 40's from a European business school holding a Ph.D. from his home country. The trend is more female participants, more co-authored studies, more studies from the cooperation between businesses and business schools, a more triangulated methodology, and more qualitative studies. The trend is, however, slowly changing as might be expected. However, 2020 might be a trendsetter for faster changes.

5. Knowledge-itis, instrument-itis and problem-itis

The papers are suffering from "instrument-itis" and to some extent from "knowledge-itis," but they are indeed not suffering from "problem-itis." Problem-oriented research is demanding and requires systematic and logical argumentation (Lawrence 1992). Problem-orientated research might be a weakness for knowledge management researchers. The researchers do the statistical tests well, and the researchers present the data in "nice" total packages as a form of scholarly truth. However, very few results conflict with existing results or anything. 2 of 3 hypotheses are correct, and 1 of 3 hypotheses is incorrect. There are many similar hypotheses/propositions (54%) in papers dealing with knowledge sharing and knowledge management, while 61% reach the same result and 39% reach a different result for similar propositions and hypotheses. The Popperian falsification process (1973) is used for both explicit and tacit knowledge processes even if 82% in 2017, 84% in 2018, 83% in 2019, and 68% of the papers in 2020 do not distinguish between tacit and explicit knowledge processes. The inability to distinguish between tacit and explicit knowledge might represent a lack of theoretical sophistication (Polanyi 1964). Two-thirds of the papers lack a definition of knowledge, information, management, leadership, or the situations these concepts are used within. The lack of definitions presents a kind of storytelling where a story exemplified with statistics is told. The scholarly and scientific storytelling is what Kuhn (1970) labeled a pre-scientific situation where anything might be equal in importance or what Popper (1968) described as the situation for psychology as a field. Kuhn (1970) called this "something less than research." The lack of problem-itis makes it challenging to make progress and accumulate knowledge; as Olaisen and Revang (2018) noted, there was no progress in understanding and performance of tacit knowledge.

More than 60% of the papers write about the need for new knowledge leadership, knowledge management, and knowledge organizing. The papers, however, are centered around traditional leadership, management, and organization issues. The paper's label and marketing are proposing new ways of leadership, management, and organizing. However, they neither define the situation today than the situation tomorrow nor how we will take us tomorrow. The papers are promising the "promised land," but in the end, tomorrow's management is the same as today's management. The papers' problems are centered around solvable matters and very seldom if anytime, related to unsolvable problems. We define such "instrument-itis" and "knowledge-itis" in knowledge management research as a misdirecting striving for respectability. Forty of 430 papers (9.3%) discuss our ecological systems' problems and what we need to do to solve the climate crisis through sustainable businesses. These green ecological papers ask several questions they cannot answer and are thus speculative and are all conceptual papers without any empirical basis. The 2020 conference doubled the number of green papers and increased the conference's relevance for our current business situation.

We introduced Tornebohm in the literature review, and we have integrated all the papers into his framework as an analytical tool to pinpoint critical findings. The papers are mainøy dominated by being instrument-it in their format to try to achieve scientific quality through advanced quantitative statistics instead of testing the author's qualifications rather than adding new knowledge. The papers build upon already known knowledge and by that are knowledge-it is. Few papers, less than 10%, end up with conceptual, theoretical papers or papers raising new social and business problems and are not dominated by problem-it.

6. The aspects of the world studied

We are making a distinction between four areas of knowledge in management research: "What we know" (1), "What we know that we don't know" (2) and "What we don't know that we know (3) and What we don't know that we don't know" (4). Area (1) will define the area (2), while there will be a misinterpretation and bias towards the area (3) and area (4).

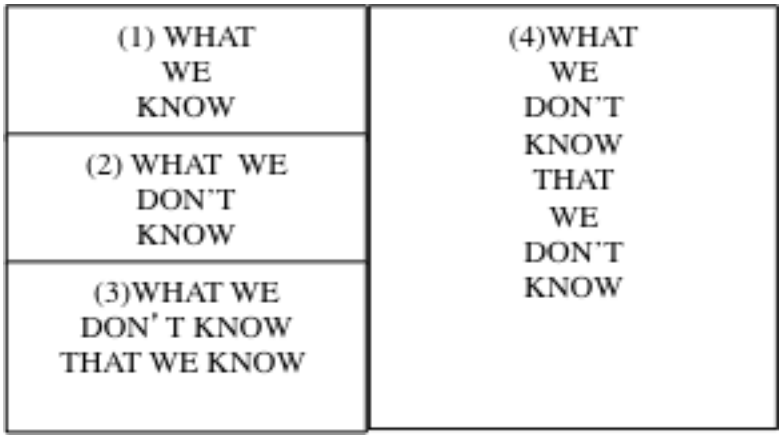

Figure 1 Knowledge representations (Olaisen 1985)

For areas (3) and areas (4), will imagination and intuition be necessary for the creativity needed to make a scientific movement in knowledge management in zone 3 and 4? If we expand only into area two, it will be somewhat limited knowledge research emphasizing instruments and knowledge while the problems will be defined by what we know.

If we want to move between areas one and two, logical, empirical studies ("secure and clean studies") will be ideal. However, the source of bias and misinterpretations start as soon as we move into what we do not know anything experienced. We will here begin to involve imagination and intuition. Experience-based intuition is the start point of any essential research effort. At the same time, the movement from area one to area two is only instrumental puzzle-solving, most often without any knowledge accumulation (Minzberg 1979, Morgan 1980). The way to improve our technique is not to attempt to analyze things into their elements, reduce them to measure and determine functional relations, and educate and train our intuitive powers (Knight 1936). Suppose our role is only to produce some publishable or travelable research. In that case, we are reduced to mechanic puzzle-solving, demonstrating that we can master the techniques we were learning in our Ph. D's. Between 70 and 80% of the research papers represent mechanic puzzle solving (Morgan 1980). We are sending out a questionnaire to a large sample getting a 5-20% response rate. Applying statistics and classifying research results in nice tables, diagrams, and figures, getting more of the same trivial already known knowledge. The 2020 papers are slightly more based upon qualitative in-depth interviews, constructed datasets from several studies, and theoretical foundations. Several papers in 2020 open up for discussing what we do not know that we know as the papers discuss how we will be coping with COVID-19 pandemia and the climate situation in the years to come. The papers take a more considerable risk upon concentrating upon the problems instead of the knowledge and the instruments.

Olaisen's figure and theory add mainly to one crucial area. More and more research is taking up or concluding with “What we do not know that we know." It appears that green papers and papers presenting sustainable problems and solutions are dealing with what we do not know the consequences of. Most studies are working within what we know and pretend to offer new solutions without offering them.

7. Scientific orientations

Galtung (1972) assumes that a common goal of all social sciences is to establish what are called sentences dichotomizing their "world space" by including some defining the empirical world by including some "world points" and excluding others. Hence, data sentences explain the empirical world by including what is observed and excluding what is non-observed. Theory sentences (hypotheses or propositions), on the other hand, define the foreseen world, including aspects that are predicted by the underlying theory. Finally, value sentences refer to the preferred world, including what is accepted and excluding what is rejected. Most of the papers (65%) in 2017, 63% in 2018, 61% in 2019, and 51% in 2020 do not develop hypotheses but only describe the theory's findings without concluding them into hypotheses for testing (Bunge 1967). However, the research compares data sentences with theory sentences without using Popper's falsification principle (Popper 1972). Dissonance does not produce new theory sentences, while a consonance occurs in noting that the research results align with mainstream knowledge management research. Criticism is the type of scientific activity where data sentences are confronted with value sentences. By the tenets of this orientation, consonance is created by producing new

data sentences by changing reality into an acceptable condition. Criticism is not a large part of the ECKM 2017, 2018, 2019, and 2020 papers (15% versus 16% versus 18% versus 24%). The trend is towards more criticism-based papers. Criticism is needed through values, speculations, and ad hoc methods to advance a field even if the validity and reliability are low.

Constructivism implies comparing theory sentences with value sentences to see to what extent the foreseen world is also the preferred world. Consonance refers to what is adequate, and dissonance to what is inadequate. In dissonance, theory and value sentences are about equal priority, and both might be changed in knowledge management research. Constructivism represents 20% of the papers, increasing from 15% in 2017 to 25% in 2020. The business reality is today complex and global. Combining the understanding of both wholisms and atomisms is needed in a good research strategy (Minzberg 1979) and actionable puzzle solving (Morgan 1980). Imagination and intuition are required for this process (Bunge 1967, Alvesson and Skjoldberg 2009). The intuitive powers seem to be less trained among the ECKM researchers.

Intuition, imagination, and creativity are needed to handle a high degree of complexity like scenarios for the business future or the green environmental future. Such complex scenarios are only handled in 43 of the papers (10%). Both criticism and constructivism are handled simultaneously to develop what is acceptable and unacceptable for society going on with what is further adequate and inadequate for the businesses. The distinction between what is acceptable and what is adequate might, as a result, give us a greener, more innovative, and safer world where businesses and societies walk hand-in-hand. The paradigmatic perspective change results in more subjective and actionable research for a better future missed in the ECKM 2017,2018 and 2019 papers while increasing 2020 papers. Also missed is what kind of leadership will take us into a more responsible, sustainable world. The knowledge management papers represent the status quo and the existing business elite. We have to ask the question of what is acceptable and what is not acceptable. We have to construct our data for this purpose since data in itself does not prove anything. It is only our argumentation that can prove anything. We need constructivism, where we ask what is adequate and what is inadequate for a sustainable future.

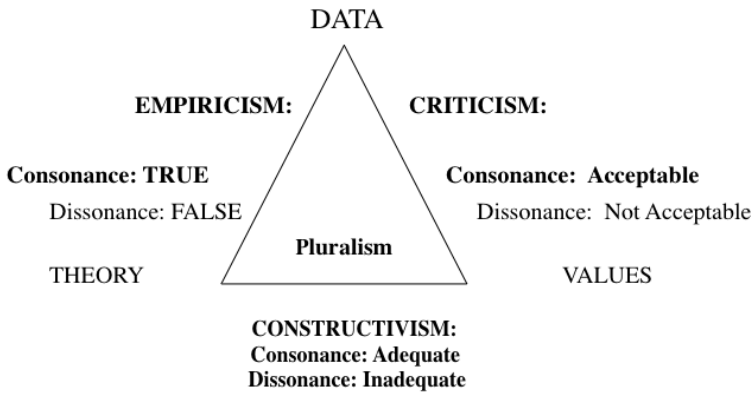

Figure 2: Empiricism, criticism and constructivism

Galtung's framework was well integrated into the results, especially the lack of constructed studies asking about what is adequate and inadequate missed out and are intensely needed to construct the data for greener and more sustainable businesses. There is an increasing number of studies based upon criticism asking about what is acceptable and not acceptable. The critical studies and the constructive studies are representing relevant and engaged research. The majority of studies in the four conferences are empirical studies representing yesterday's practice and theory. Galtung's model from taken from a working paper in 1972 proved to be very useful and excellent to integrate.

8. The rise and fall of paradigms

The essence of Kuhn's position (1970) is that paradigms serve a normative and conserving function. When a standard prevails in a discipline, "normal" science practice evolves as a puzzle-solving activity. During normal science, the scientific community works under the assumption that "it knows what the world is like," and is prepared to defend this assumption "at any cost." (Kuhn 1970: 5). Very often, normal science suppresses "major

novelties, conceptual or phenomenal" (Kuhn 1970:36). According to the traditional viewpoint or preconception, scientists are mainly preoccupied with solving problems/puzzles according to accepted specific rules. With such anomalies built up and scientists losing faith, the field enters the crisis stage.

Kuhn writes that "there can be a sort of scientific research without paradigms, schools, perspectives"… (1970:11), in such research "… though the field's practitioners were scientists, the new findings of their activity were something less than science or social science" (1970:13). He further notes that "… every individual researcher starts over again from the beginning" (1970: 13), that some competing schools are directing their publications where they may be published. A continued discussion over the same fundamentals and no scientific progress is made at all" (1970: 159).

We may sum up Kuhn (1970) in this way:

1. Only readily available facts are collected.
2. At this stage, all facts seem equally relevant.
3. The instruments are overemphasized and often presented in “quasi-fanciful” ways to get “false” respect.

If we look at knowledge management research at ECKM, we conclude that this is the situation for more than 80% of the papers. The 2020 papers were more scientific than the 2017, 2018, and 2019 papers – 71% versus 83%. There is in 2020 progress in making knowledge management more scientific and robust. We found that Kuhn's description fit the situation in knowledge management research well. It looks like every researcher starts over again from the beginning with was easily collected survey, and case data are assembled and presented in fancy scientific ways. The papers in 2020 (24%) upon sustainable businesses, greener businesses and societies, and the future of knowledge work represent a positive change. Kuhn's description of the state-of-art in a pre-paradigmatic stage fits completely with state-of-the-art knowledge management. Facts are collected where the researchers can get them most often in extensive emails surveys with low response rates. An enormous number of facts seem equally essential, and everything is presented in state-of-the-art advanced statistics. We will conclude that this is a form of science with low creativity, relevance, and engagedness. We get a ben-over-here-it. Comes-again feeling, but this descriptive research might have a high recognition rate for established practices.

The papers in 2020 on sustainability, gender equality, and new professional working forms 2020 opened up perhaps for a new generation of critical business and societal researchers at ECKM. We found for the first time as much as one-third in this group, and then we might get a critical mass of renewers for the subsequent ECKM conferences. The papers might concentrate on new knowledge management paradigms for sustainability, green corporations, and gender issues. The ECKM conference needs common paradigms and shared perspectives.

9. Alternative concepts

The concepts have an essential role in any scientific inquiry. They are usually the anchor point in the interpretation of findings (Blumer 1969 and Baugh 1990). The concepts are the glasses we have used since we got our Ph.D.'s. We discuss two different worlds of ideas. The definitive concept is based on empirical data or "evidence" and often searches for causal relationships.

The more definitive concepts are linked to "what we know and "what we know that we do not know, while the more sensitizing concepts will be related to "what do not know that we know and "what we do not know that we do not know." Sensitizing concepts will advise where to look and will set up and compare alternative views. They will indicate more relationships, and they will be dependent on inductive research methods and precise descriptions. Definitive concepts represent deductive quantitative research methods. For induction, the sample of 0 (imagined sample) or one might be good enough, while deduction requires large samples. Induction is closeness, while deduction is distance. Induction is participation and involvement, while we do not interfere at any price. Induction might be exploring, and actionable while deduction might be explaining without action.

In knowledge management studies, the definitive concepts are taking over the ground of the sensitizing concepts. Taking all the papers and dividing them into one of these ideas, around 65% of the studies rely on definitive deductive theories while 35% rely on inductive sensitizing concepts. In the ECKM 2020, about 55% rely upon definitive concepts, while 45% rely upon inductive sensitizing concepts. The induction process described as “directions along which to look and use intuition and curiosity” instead of facts or data is less used. Intellectual

curiosity might be the path to choose for creative scholars. The papers are becoming more inductive and sensitizing in the 2020 conference than the 2017, 2018, and 2019 conferences.

The distinction between definitive and sensitizing concepts worked well as an analytical tool with a simple and usable distinction.

10. Alternative research paradigms

It is here proposed to analyze knowledge management research from four main perspectives. These alternative realities are different meta-theoretical assumptions about the nature of social science. The empirical paradigm where its explanatory power consists of establishing causal variables between variables. The knowledge systems and the knowledge technology relations have a concrete, actual existence and systematic character producing quantitative and qualitative findings according to the need for the societies and businesses. The business world is considered primarily conflict-free and harmonious at a higher level of aggregation. 50% of the studies in 2018 versus 45% of the 2019 papers belong here compared to 38% in 2020. The trend is towards fewer empirical papers.

The materialistic political paradigm where physical events and behavior are the surface manifestations of underlying mechanisms. The materialistic paradigm relies on the assumption of predictable uniformities in the knowledge systems. The world of knowledge systems exchanges is defined by concrete, measurable, ontologically fundamental structures and the interdependencies in knowledge systems. 20 % of the studies in 2018 are here versus 21% in the 2019 conference and 16% in 2020.

The clarified subjectivity paradigm holds that social reality does not exist in any concrete sense but is the product of individuals and organizations' subjective and inter-subjective experiences. According to this paradigm, knowledge behavior must be understood from the employee and organization's viewpoint rather than from the outside observer. We can only get such understanding by direct, give-and-take interaction with the employees and organizations. We can, of course, get in surveys as questionnaires, but then we are defining the questions and the business situation. 25% of the studies in 2018 are here versus 27% of the 2019 studies and 32% of the 2020 studies. The action paradigm (5% of the studies in 2018 and 7% of the studies in 2019 compared to 16% in the 2020 studies) also assumes that what passes for reality is socially determined. The move towards clarified subjective paradigms and action-based paradigms in 2020 is significant. A more sensitizing knowledge concept along subjectively chosen directions demands another kind of research paradigm. The role of knowledge research is to identify the stakeholders in the systems, their goals, interests, and power bases to describe the conflicts and contradictions of the knowledge systems and show how to emancipation, for instance, working smarter or greener. Knowledge management researchers inspired by the action paradigm are concerned with discovering how individuals can link thought and action as a means of transcending their alienation. The papers often analyze the situation where the author is a consultant, owner, or employee. The relationship to the investigated firm is close. The results are own experiences, knowledge, and attitudes from the actual situation resulting in practical and theoretical recommendations.

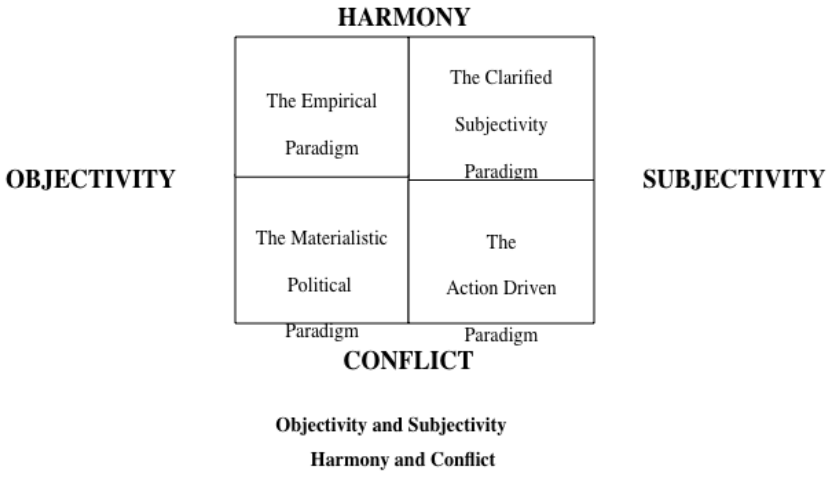

Figure 3: Research paradigms (Olaisen 1984)

The division of papers into four paradigms integrated well with the nature of the papers, and the four conferences moved on from the empirical paradigm to the clarified subjectivity paradigm and further to the action-based paradigm while the materialistic paradigm including a green society. The four paradigms will be well suited to analyze any ECKM conference for many years to come.

11. Alternative action-based cases in 2020

The three papers from Berkeley and Barcelona investigated two restaurants using organic food and wine within 50 km from the restaurant and only employing local staff members. Using only local resources might be a future for many businesses. The three papers action-based research proposed a radical change in how the companies of the future organize. The articles tell a subjective story about the need for change, but they raise actual problems bringing together several social and natural science references. In Barcelona, the tale of Brutal Bar illustrated how the first wine bar with only natural wines started and survived and thrived by only selling natural wines. The taste of wine is evident, a habit that can be changed; the three papers are examples of needed engaged research involving design, innovation, and knowledge. Chez-Panisse in Berkeley has thrived for more than thirty years under the same manager and has always been global in tastes and quality, serving both the affluent and not so affluent on two levels. Chez Panisse is demonstrating that locally produces works to the complete satisfaction of their customers.

We will soon be finding bars for natural wines and restaurants with short-traveled organic food worldwide. The innovation and design of sustainable businesses should be a cornerstone of all research, and there should be more of that kind of research among the proposals rejected. The survival of a large ECKM conference might be based upon such cases.

12. Knowledge management as a part of an open and critical society

The action-driven and the clarified subjectivity paradigms represent a different degree of complexity and subjectivity. They represent both harmony and conflict. Various levels of complexity require different research paradigms; Pluralism is demanded to catch different aspects of reality. Subjectivism is necessary to capture complexity.

Consequently, we will have to define this discipline as a subjective multidiscipline, and we will have to innovate and simulate an experiment to a much higher degree. We will have to accept ad-hoc hypotheses and ad-hoc methodological solutions and the clarified subjectivity. We need to cooperate with businesses and society to research sustainable societies and businesses supporting greener, more thoughtful, and safer solutions. A more engaged knowledge management research field is needed to be a part of the sustainable, global, and digital businesses replacing traditional businesses.

Intuition, imagination, and creativity are needed to handle a high degree of complexity like scenarios for the business future or the green environmental future. We process such complex scenarios in 40 of the papers (9%) where both criticism and constructivism are handled simultaneously to develop what is acceptable and not acceptable for the society going on with what is further adequate and what is inadequate for the businesses. This significance might, as a result, give us a greener, brighter, and safer world where the corporations and societies walk hand-in-hand. We miss subjective and actionable research for a better future in the papers. Also lost is what kind of leadership will take us into a more responsible, sustainable world. The articles represent the status quo and the existing business elite. We have to ask the question of what is acceptable and what is not acceptable. We have to construct our data for this purpose since data in itself does not prove anything. It is only our argumentation that can prove anything. We need constructivism, where we ask what is adequate and what is inadequate for a sustainable future. We have to apply our values for asking the Weberian question (Weber 1938) for a functional business and society or the Popperian problem (Popper 1973) of an open society. The meeting between a constructed reality and an actual reality gives scenarios of adequate and not adequate scenarios.

Consequently, we will have to define these disciplines as a subjective multidiscipline, and we will have to innovate, simulate, and experiment to a much higher degree. We will have to accept ad-hoc hypotheses and ad-hoc methodological solutions and the clarified subjectivity. We need to cooperate with businesses and society to research sustainable firms and organizations supporting greener, more innovative, and safer solutions. A more engaged design, innovation, and knowledge research field must be a part of the sustainable, global, and

digital businesses replacing traditional businesses. To keep an open, liberal society, we need a critical discussion about what kind of research will contribute to a greener, brighter, and safer community. Popper (1973), the advocate of the logic of science, was also the advocate of an open society. Popper (1973) explicitly wrote that and free community is a fundament for pluralistic and critical research. Design, innovation, and knowledge are cornerstones built upon a liberal open society. There will not be any progress in these disciplines without a free community. Lakatos's (1970 and 1978) position as a critical rationalist built upon Hegel's theses and antitheses tested and failed through critical discussions between researchers. The synthesis, according to Lakatos, will be subjective as a proposal of as-good-as-it gets at the time being. Knowledge management research is built upon as-is descriptions never falsified or verified, often not exploring and explaining new solutions.

Lakatos's position is, however, built upon a society allowing experimentation, creativity, and discussions. He was a firm believer in Stalin's centralistic Marxism-Leninism. Still, as a professor in logic at Cambridge in the1950's he concluded that only an open society with a balance between the humanities, social sciences, and natural sciences would allow for the antitheses in pluralistic programs and schools. Toulmin's book "The Uses of Argument" (2003) strongly advocates that any truth is relative depending upon the cultural and historical context. Only an open society can provide this context. Toulmin (2003) and Popper (1973) are close to Wittgenstein, proposing that the language as a critical and complex system requires that pluralistic and different views of reality are presented. The question is, why does not such a highly ranked conference open up for a critical discussion of today's procedures and rules for today's outdated way of doing business. Why do so few professors ask the questions about what kind of sustainable business we need tomorrow and what actions take us to tomorrow's sustainable business? The industrialization of the professor's role as an ordinary knowledge worker serving the system as an industrial worker serving the industry might be why. The road from little business science to big business science might give fewer critical research voices. The future of knowledge management is an open critical society that advocates academic freedom to come up with independent critical solutions advocating new green and sustainable paradigms.

13. Synthesis and conclusion

Figure 4 presents a form of synthesis of our reflections. One of the axes represents the degree of complexity, and the other the level of subjectivity. The definitive concepts represent a small degree of subjectivity (i.e., the high degree of objectivity, if possible), while the sensitizing concepts express a high degree of subjectivity. The four paradigms might be subjective or objective. Objectivity does not exist any longer. The problematic question is: if we choose one model, will it then be possible to move on from a low degree of complexity to a higher level of complexity (i.e., can we generalize from a tiny part of reality to a more substantial portion of the fact). Are the models interchangeable? It might be impossible or difficult to move up the line from origo to a higher degree of complexity and from the top to Origo (Alvesson and Skjolberg 2009, Bunge 1967). The knowledge research reality in both sustainability and climate conflicts offers global complexity. To understand this, we must apply subjective paradigms combined with empirical investigations for theory building (Eisenhardt and Grabner, 2007). We have to use sensitizing concepts coupled with actionable definitive ideas. We have a field like knowledge research to understand whether applying it is subjective, but knowledge research should still be systematic and logically rigid.

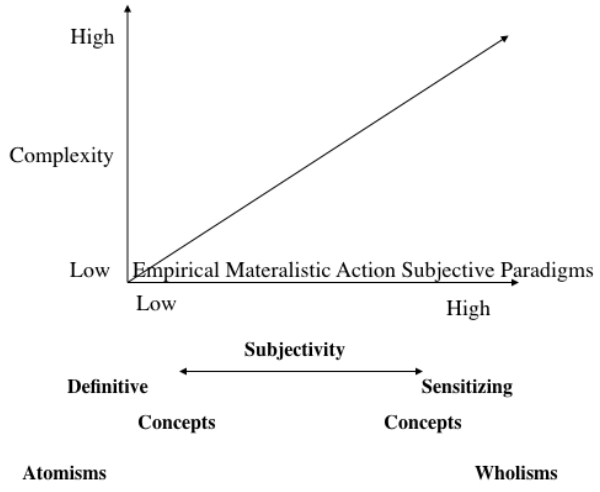

Figure 4: Complexity and subjectivity versus paradigms and concepts

The high complexity world in business is represented by unorder, complexity, chaos, innovation, open rules and procedures, induction, exploring, and exploiting fast facts. Most forward-running businesses are looking for what they do not know that they know. They are operating in many cultures with a high degree of complexity where they are retraining all employees from the university. Digitalization, working greener and more intelligent, robotics, and globalization demand a high degree of complexity and a high degree of subjectivity while globally delivering goods and services, requiring a lower degree of complexity and definitive procedures. The combination of efficiency and effectiveness is the essence of all businesses today and should also focus on future knowledge research. We need researchers saying that this is bullshit in a greener world and researchers saying this is the way to success meeting at future ECKM conferences.

14. The practical implications

The practical implications of the study might be many. Engaged research is problem-focused research looking into the actual problems of our businesses and societies, asking about new solutions and how we can contribute towards more sustainable and greener enterprises and communities, and even dare to ask questions about equality and the distribution of wealth. Imagination and intuition might be more needed than readily available facts to be measured. Creativity is required to formulate the problems and discuss solutions. Pluralism requires combining the empirical paradigm with the action paradigm, and theoretical and conceptual papers need to address how to make progress in information and knowledge management. This progress will come from engaged in practical research. We, however, the practical realities have to be challenged with problems about what is adequate and what is not appropriate for businesses and societies for tomorrow's sustainable reality towards more thoughtful and greener businesses.

We need more relevant knowledge management research to take responsibility for becoming more connected and more applicable. Any organization will have people, organizational structures, organizational processes, technology, tools, and a context. How do we design, innovate, and knowledge leadership working smarter, greener, and safer towards business and societal sustainability? We have to get research that describes, explores, reflects upon, participate, and changes corporations and societies.

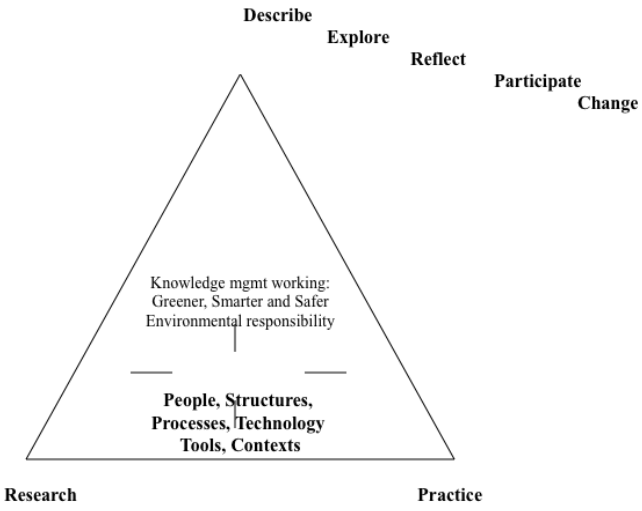

Figure 5: A responsible research agenda

15. The theoretical implications

Our answers to our research questions will also form the theoretical contribution of the study:

1. What is the KM philosophy of science framework characteristics of academic research papers in contemporary KM presented at the ECKM conferences?
   The theoretical implication of contemporary KM is a research field without common paradigms, domains, and perspectives without accumulating knowledge. The KM researchers do not understand the nature of knowledge management as a field where the research cannot be replicated, synthesized, or theorized. Knowledge management needs to move along from the empirical research paradigm to a clarified subjectivity and action-based research. The criticism implying acceptable/unacceptable

solutions and constructed adequate/inadequate solutions for corporations and societies have strengthened their place, offering new paradigms and perspectives.

2. What is the philosophy of science requirements to make KM research more creative, engaged, and relevant?
   There need to be an acceptance that nature and model for KM do not fit the natural sciences and objectivity requirements but need to deliver 50% of the research as part of action-based and clarified subjectivity paradigms.
3. How can we make KM research more creative, engaged, and relevant?
   The only way to do this is to let in controversial, greener, and sustainable studies, whatever objectivity or objectivity the studies have.
4. How can we make KM research contribute to more sustainable and greener businesses?
   The only way is to have a strategy and prioritize these studies on behalf of the objective empirical studies.
5. What are the future characteristics of KM research?
   KM will have a higher responsibility for sustainability and greener corporations and the possibility of accumulating knowledge into replication and synthesizing for general knowledge.
6. What is the rate of tested and replicated, tested but not replicated, and untested KM research?
   The rate of tested and replicated studies is for the four conferences zero. The tested part, but not replicated, is 80-90%. The rate of untested cases is 10-20%.
7. What is the rate of untheorized untheorizable concepts, theorized, but not synthesized and theorized and synthesized KM?
   The rate of untheorized untheorizable concepts is zero, the rate of theorized but not synthesized studies is zero, while the number of synthesized, theorized, and conceptual studies is around 20%. The results only tell about the nature of the concept of knowledge combined with management that is very difficult to theoretician, synthesize and replicate in tests.

16. Limitations and further research

The first limitation to the study is if the ECKM conference is representative of knowledge management research.
The second limitation is if the contemporary philosophy of science framework is representative and applicable for the study.
The third limitation is if the coding and classifications are too subjective and work like getting shit in and shit out.
The fourth limitation is a literature review concentrating upon the epistemology of knowledge. The philosophy of knowledge does the KM right compared to a literature review only concentrating upon KM itself.

Further research should identify the most cited KM and use the same contemporary philosophy of science frameworks comparing the results.

Further research should also be done to find acceptable KM research where studies are replicated and compare the results to unreplicated studies.

Further research should also be done identifying theorizing and synthesizing KM studies to evaluate the theorizing and synthesizing towards ordinary KM studies discussing what makes synthesizing and theorizing possible,

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